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THE DIAGNOSIS AND TREATMENT OF CARCINOMA OF THE COLON AND RECTUM*

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WHILE the subject on which I have been asked to speak to you is "Tumours of the colon and rectum," the greater interest is carcinoma and the paper will be limited very largely to that subject.

In Massachusetts there are about 5,000 deaths from carcinoma per year; 12 per cent of this number are in the rectum and colon, and of these 600 cases, 65 per cent occur in the rectum. After making a very liberal estimate of the number of radical operations, it is difficult to believe that 15 per cent of the total number are given a radical operation. If but 15 per cent of the total number of patients in the state are operated upon, and some of us operate upon between 50 and 60 per cent of the cases seen, it must be evident that the diagnosis is made very late and that many patients never see a competent authority as to the advisability of operation. As further evidence that there is a lack of interest among physicians, it is a fact that one osteopathic physician has sent me more cases of carcinoma of the rectum than all the regular physicians in the same region. It is a fact also that certain physicians, even in small towns, become interested in the condition and find cases of carcinoma of the colon and rectum frequently, while others never find one. In other words, physicians find these cases when they are interested. I have said many times that a diagnosis has not been made in less than the average of eight months because of the lack of interest and not because of the difficulty in diagnosis. It may be difficult to make a diagnosis of carcinoma of the colon, but it is never difficult to make a diagnosis of carcinoma of the rectum, for there are definite suggestive symptoms and the diagnosis can always be made by digital or proctoscopic examination. The difficult cases need not be diagnosed by the physician. All that is necessary is that he should know that the symptoms are suggestive of carcinoma of the colon or rectum. The final diagnosis can well be left to the surgeon.

Many have, I think, been confused by the many and often unimportant symptoms given in the various text books, and by the emphasis placed on symptoms of little or no importance. The suggestive or early, and therefore important, symptoms are few and simple. Perhaps the most concise statement is:—any change in bowel habit or sensation, or bleeding from the rectum, suggests carcinoma of the rectum or colon. For some reason, our students leave medical schools without being impressed with the fact that the *most important* cause of bleeding from the rectum is carcinoma. They prefer to remember that the *most frequent* cause of bleeding is hæmorrhoids. If students could grasp this one thought, many carcinomata would be found early. Bleeding from the rectum is undoubtedly the most important suggestive symptom, and careful attention to the determination of the cause of the bleeding would bring many patients earlier to operation.

Carcinoma of the colon and rectum begins on the surface, and therefore ulcerates and bleeds early. It is true that the bleeding is not always observed early. In carcinoma of the right colon

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the blood is always mixed with the stool and unless it is profuse it is found only by chemical test, while in carcinoma of the left colon and rectum the blood may be found on the outside of the stool until the growth has narrowed the bowel sufficiently to cause frequent loose movements. In suspected carcinoma of the colon or rectum at least four stools should be examined, and only after at least three days of a meat-free diet. It should be remembered that blood from a carcinoma of the colon or rectum is frequently visible and should be looked for over periods of several days. If one is careful to question the patient, other symptoms will frequently be found which suggest, with the bleeding, more than hæmorrhoids. Anæmia is much more frequent in carcinoma of the right colon than of the left; in fact, a marked secondary anæmia may be the only indication of a carcinoma of the cæcum.

Constipation is frequently spoken of in textbooks as one of the early important symptoms of carcinoma of the colon and rectum, but as a matter of fact constipation is not present until there is moderate obstruction, which does not occur early. One should always remember that the first symptom of a growth should be slight irritation of the bowel, and, therefore, moderately increased peristalsis rather than constipation. In these days of oils it is only rarely that the patient admits that he has been constipated. The use of oils has undoubtedly delayed the diagnosis from one to four months. The old compound cathartic pills would usually cause sufficient pain to make the patient seek advice early. The period of constipation frequently passes quietly into the period of what the textbooks call diarrhœa, a term which should not be used, as very few patients recognize their symptoms as diarrhœa. They will generally admit that they have frequent movements, but to determine just what is happening one must ask how many times the patient goes to stool to get rid of gas, mucus, blood, or stool. By the time the surgeon sees the patient frequent movements are present in a high percentage of cases.

Again, the textbooks are very fond of speaking of "alternating constipation and diarrhœa", but as many patients do not recognize that they have been constipated, and do not admit that they have had diarrhœa, the inquiry is quite useless. The patient may recognize that his bowels are not quite right, as he is taking oil and occasionally a cathartic, and after the cathartic he has many movements, but he does not recognize this as alternating constipation and diarrhœa. This time-honoured symptom should be given up, along with ribbon-stools, loss of weight, and the age of the patient. The ribbon-stool is due to the consistency of the stool and the shape of the sphincteric opening, rather than to a growth in the sigmoid or rectum. Loss of weight rarely occurs until after marked obstruction or metastasis in the liver, which cause loss of appetite. Carcinoma of the rectum or colon rarely causes loss of weight *per se*, as is proved by the gain in weight after colostomy. It is true that the greatest number of cases are found between the ages of 50 and 60, but it must be remembered that between 4 and 5 per cent occur between the ages of ten and twenty-nine years and that the percentage of cases increases rapidly from the ages of thirty to sixty, when it begins to decrease.

Pain is always considered an important symptom of carcinoma anywhere, but patients rarely admit pain in carcinoma of the rectum. Locally, there may be a feeling that the rectum has not been emptied, not infrequently called constipation, and due to the irritation of the growth, usually low in the ampulla. There is frequently a dull ache across the back in the sacral region and discomfort in the rectum when sitting. This may be found with growths as high as the recto-sigmoid junction. In far-advanced cases the infiltration from the growth or from a metastasis may cause severe pain along the sciatic nerve.

Abdominal pain should be present more often than the patient admits, and it is present more often in carcinoma of the colon than in carcinoma of the rectum. Pain due to obstruction should be referred to the lower abdomen in these cases, but in spite of the fact that there is almost constant hyperperistalsis, it causes little discomfort and the patients seem to become immunized to it. If one wishes to know whether there is any obstruction, he must ask if there is much movement of gas in the lower abdomen. It is true that at times one can get a history of repeated attacks of lower abdominal pain due to obstruction, but this is rare. Attacks of abdominal pain due to obstruction are much more frequent in carcinoma of the colon than

in carcinoma of the rectum. At times these patients, without appreciating that they are even constipated, suddenly become obstructed. It should be remembered that in carcinoma of the cæcum the pain caused by obstruction is frequently in the epigastrium, or at least above the umbilicus, that is, small intestine pain. Patients are frequently treated for indigestion, probably because of some abdominal discomfort and loss of appetite, but this should occur but rarely if a careful history is taken.

Any of the above symptoms are suggestive of carcinoma of the colon or rectum, and diagnosis of a rectal growth should be made with ease by the means of digital and proctoscopic examinations. Digital examination of the rectum, if properly made, should determine definitely whether or not there is a carcinoma of the rectum in a large proportion of cases. If a routine examination is made with the uncovered finger, a thin lubricant, and the patient in an improper position, tense and frightened, the growth will be found only in a small percentage of cases, as the finger will seldom reach above the lower portion of the ampulla. In the last ten cases seen, all have been treated for eight months or more without a proper diagnosis, and yet in all the growth could be easily felt. One is tempted to go into the details of the technique of a proper digital examination because of its importance. Harrison Cripps said some years ago that a proctoscopic examination was unnecessary in the diagnosis of carcinoma of the rectum, as the growth could always be felt by a proper digital examination. I would agree that it is possible to feel the growth in a very high percentage of cases if the physician knows how to make a proper digital examination and takes some interest in finding something! The annular growths are frequently missed because they project into the rectum like the cervix into the vagina. The finger can then sweep about the circumference of the rectum without feeling anything.

It is to be remembered that an effort should be made to feel any mass in the pelvis as well as in the rectum itself. In this way a high growth, or even a growth in the sigmoid which has fallen into the pelvis, may be found. Metastases in the posterior cul-de-sac from carcinoma anywhere in the abdomen can sometimes be felt. Masses anywhere in the pelvis should also be felt for. A careful digital examination should be made before any proctoscopic examination is undertaken, as has been made evident by the many cases in which the growth has been overlooked by the proctoscope but could have been easily felt on digital examination. The proctoscope, if intelligently used, should determine definitely whether there is any growth between the anus and lower sigmoid, and should give evidence of any condition causing bleeding above the region reached by it. In addition to giving us positive evidence of a carcinoma, if present, we may obtain positive evidence of polyps, chronic ulcerative colitis, or other ulcerations. Colitis should not be diagnosed unless there is positive evidence of its presence. The reddened mucosa due to an enema should not be mistaken for a colitis.

The use of the proctoscope as an instrument to feel with should not be neglected. Not infrequently the growth is adherent in such a position that it cannot be seen but can be felt with the instrument. This is also true of metastases in the posterior cul-de-sac from growths anywhere in the abdomen, tumours in the pelvis, metastatic glands in the pelvis, and growths in the sigmoid which have fallen into the pelvis. Care should be taken to avoid overlooking at polyp or small carcinoma, at about 15 cm. above the external anal orifice, on the anterior wall just above the fold which is present at that point. In the effort to get the proctoscope above this fold one must press the fold forward and the instrument upward at the same time. A polyp or small growth may in this way be covered by the end of the proctoscope. This error can be avoided by careful inspection as the proctoscope is withdrawn. Recently several cases have been diagnosed after proctoscopy as colitis, in which a carcinoma but no colitis has been found. This is due, we believe, to the fact that the rectal wall has not been properly wiped and dried during the examination. It can be due to nothing but carelessness in some way, for colitis when present should not be mistaken.

The proctoscope should be used more frequently and intelligently to determine the source of bleeding. It is true that a carcinoma of the colon cannot be seen above the lower

sigmoid, but if blood is seen coming from above the proctoscope it can be assumed that it is coming from a carcinoma or polyp, both of which require removal, or very rarely from some ulceration such as a tuberculosis. Patients should be examined during a period of bleeding, and if no flecks of blood are seen above the lower portion of the ampulla it is evident that the blood is coming from hæmorrhoids or an ulceration in the lower portion of the ampulla.

I have been in the habit of advising all surgeons and medical men to use the proctoscope rather than to leave it to experts, as advised by Lockhart-Mummery, but the errors have been so frequent and costly to the patient that I have come to the conclusion that it may be necessary to limit its use to skilled men, which would be unfortunate. To make the diagnosis positive a specimen should be removed for microscopic examination. For those experienced in the diagnosis of these cases this is often not necessary, but for those who believe in operating only upon the less malignant types of growths, the removal of a specimen is of great importance.

A warning that the pathological report of adenomatous polyp should not be accepted even after several sections have been examined should be often repeated. The base of the polyp, of which it is almost impossible to get a section, may be carcinoma. Removal of the polyp, if a diagnosis of carcinoma cannot be made, should always be done with the cautery and should be followed by frequent proctoscopic examinations. If the area does not heal and remain healed, a section should be removed and in many cases carcinoma will be found because the base where the carcinoma begins has been obtained.

It may be asked why so much emphasis has been placed on digital and proctoscopic examinations when an x-ray examination might settle the diagnosis so easily. It is true that this impression is wide-spread, but it is my firm belief that no x-ray examination of the colon or rectum should be made until carcinoma of the rectum has been definitely ruled out by other means. I appreciate that many will not agree with me when I say that 40 per cent of carcinomata of the rectum will not be found by the average roentgenologist. If this is true, or nearly true, why use such a method when digital and proctoscopic examinations will give a correct diagnosis in practically 100 per cent of the cases examined? A symptom which is of almost as much value as the roentgenological examination is the discomfort caused in many cases by the injection of the barium, and yet this is rarely reported by the roentgenologist. After carcinoma of the rectum has been positively excluded an x-ray examination of the colon should be made. I am one of those unfortunates who cannot believe that an x-ray examination of the colon alone is sufficient evidence always that there is or is not a carcinoma of the colon. While a correct diagnosis is made more frequently on the colon than on the rectum, we believe that the average roentgenologist does not make a correct diagnosis in more than 75 per cent of these cases. The figures of many roentgenologists show a correct diagnosis in 85 per cent or higher, but it must not be forgotten that at least a portion of those with negative results turn up later at other clinics with carcinoma. It should also be remembered that frequently the roentgenologist does not give us sufficient evidence on his examination alone, and unless we use the clinical history, physical examination, and all other evidence we can get, a diagnosis cannot be made. We are looking for some single method of making a diagnosis of various diseases, but certainly we do not know enough about x-ray interpretation to depend upon that alone in making a diagnosis of carcinoma of the colon. When all information and all methods of making a diagnosis are combined, a correct diagnosis can usually be made.

TREATMENT

After the diagnosis has been made, what cases shall be operated upon? Shall we operate only upon those patients whom we think we can cure, or shall we operate upon all patients whom we think we can make comfortable mentally and physically for one or more years? The effect of this decision is shown in the statistics of Miles and in my own on carcinoma of the rectum, which will be presented later. Miles operates upon 32 per cent of all cases seen, and of these 72 per cent live five years, while I operate upon 60 per cent of all cases

seen and of them 50 per cent live five years. To consider it from another point of view, I have 73 per cent of the patients operated upon alive three years, and 26.4 per cent of the *total number seen* alive five years, while Miles has 21.5 per cent of the total number seen alive five years. It will be seen, therefore, that the decision depends upon the surgeon's opinion of the value of operating upon 60 per cent of the total number of patients seen in order to give a large number of patients from one to three years of mental and physical comfort.

Aside from the fact that patients are too old or too feeble, or have some organic disease which would contraindicate operation, or have definite metastases in the liver or other organs, and a few who are evidently inoperable because of the local condition, I know of no way of determining operability except by an exploratory laparotomy. The height of the growth is no contraindication, as it formerly was, nor are the size and apparent fixation of the growth as determined from below contraindications generally. In fact, it has been my experience that the lateral wall growth which may be fairly movable, but which has a deep ulceration, is more frequently inoperable because of metastases than some of the larger and more firmly-fixed growths. In cases in which there is a question whether to operate or not, the type and grade of the growth are of considerable value.

An important question is the type of operation to be used. The question may be roughly answered by saying that the most extensive operation the surgeon is capable of performing with a reasonable mortality on the particular individual to be operated upon is the operation of choice. It is useless to attempt to operate by a standard method, for the experience of the surgeon and the condition of the patient are important factors to be considered. We believe that the combined abdomino-perineal amputation of the rectum in one stage, as advocated by Miles, is the ideal operation theoretically, but this does not make it always the operation of choice. Willard Bartlett has recently reported on a combined abdomino-perineal operation which is the reverse of the Miles procedure, as he begins the operation in the perineum, but there is not enough difference to make it applicable to any larger group of cases than Miles' operation and it accomplishes no more. We must have an operation which the particular surgeon can carry out with a reasonable degree of safety on the patients upon whom he desires to operate.

There are certain high growths which can be removed only by the combined abdomino-perineal operation, and these should be operated upon by men experienced with the operation. Some of us who have had experience with this operation find that it is too severe for certain patients. It was my pleasure to publish in 1913 a combined abdomino-perineal operation in two stages which is of value in certain cases. In this operation the procedure is precisely the same as in the one-stage operation, except that a lateral colostomy must be done high in the sigmoid and the arches from the left colic artery must be preserved in order to supply the portion of the sigmoid and rectum placed in the pelvis beneath the peritoneal flaps. The second stage of the operation is similar to the posterior portion of the one-stage operation, except for the fact that the sigmoid must be clamped and tied below the peritoneal floor. The second stage may be carried out whenever the condition of the patient has improved sufficiently, usually in from five days to two weeks. If the blood supply has not been injured there will be no necrosis and there will be a clean pelvis to work in at the second stage. Two-stage operations have been developed by Coffey, Dudley Smith, Lahey, and Rankin, and all have features which may be preferred. The idea is the same in all, an attempt to get an extensive operation which can be carried out on the more serious cases without too high a mortality.

These operations are frequently more than many surgeons care to undertake, and the patient is occasionally too old, too feeble, or too fat for either. These patients should have the next less serious and less extensive operation; that is, a permanent colostomy without any dissection of the pelvis above, and an amputation of the rectum by the posterior route. This is without doubt the operation of choice for many surgeons and is undoubtedly of great value to all surgeons in the case of certain old, feeble, or excessively fat patients where the growth is below the recto-sigmoid junction. The mortality will be definitely lower than for the combined

abdomino-perineal operation, but there are many cases in which the growth is too high or too large to be removed by this method. A fourth operation is of value in patients with high growths who are not in sufficiently good condition to stand a combined abdomino-perineal amputation. In this operation the dissection is done entirely from above. The superior hæmorrhoidal artery is tied at the bifurcation of the aorta and the dissection carried from this point down to two or more inches below the growth. The bowel is then double-clamped and sectioned, and the proximal limb turned out for a colostomy. A portion of the sigmoid, the growth, and a portion of the rectum are then removed and a colostomy made.

It will be seen that all the above operations require a colostomy, which prevents many of you from advising operation and prevents the patient from accepting it at times. Many state that they would rather die than have a colostomy, but there are two important objections to that. In the first place, the average duration of life after symptoms are noted is two years, a long time to be uncomfortable. The second objection is that the statement is not defensible, for out of some three hundred patients with permanent colostomies and the growth removed I have had but one patient who did not live a happy and contented life as long as there was no discomfort from recurrence. It is therefore unlikely that the particular individual under consideration would prefer to die. It must be remembered that most opinions in regard to colostomies are obtained from experience with colostomies without removal of the growth, which should not be compared with a colostomy with removal of the growth. The mental and physical relief obtained by a colostomy with removal of the growth is tremendous.

It is useless to talk about the various operations which have been devised to control the bowel, for we are convinced that no such operation is possible. The proper method of controlling the bowel is by diet, which is far more important than the type of operation. It is the surgeon who teaches his patient how to control and care for the colostomy who gets good results. We believe it is possible to control any colostomy by diet and enemata, except occasionally in those patients whose bowels have moved habitually two or more times a day.

Where shall the colostomy be placed is often asked, but the answer is of slight importance. We have nearly always placed it in the upper portion of the abdominal wound, two inches below the umbilicus, because it is a convenient place for the patient to have it and because placing it here saves some time at the operation. If a belt is worn it is a comfortable place to have it, for there are no bones for the ring to press on. Infection of the wound from the colostomy occurs so seldom that it need not be considered. It is true that many surgeons prefer to bring the bowel out through a stab wound in the left lower quadrant, but frequently it is so close to the crest of the ilium that the ring of the belt is uncomfortable. It is true that a belt and pouch are seldom used in these days, but this must be provided for. It is probable that a hernia is less likely in a stab wound through the rectus than in the abdominal wound. If placed high enough to avoid the crest of the ilium it is probable that a colostomy in a stab wound will be more satisfactory than in the paramedian wound. We are obliged to admit that we are beginning to feel that there may be slightly more risk of obstruction when the colostomy is in the paramedian wound. Whatever the position used, we believe it to be important to suture the mesentery of the sigmoid to the lateral and anterior walls of the abdomen to prevent the small intestines from pushing in between the sigmoid and the abdominal wall, for we consider such a condition an occasional cause of obstruction.

As there is great objection to a colostomy, and as there is undoubtedly an occasional case in which it is reasonable to leave the sphincter without much increased risk of recurrence, an attempt may be made to save the sphincter in a few selected cases. There are surgeons who take little interest in any other operation for carcinoma of the rectum. One of the enthusiasts reports that the sphincter was saved in 25 per cent of the patients having radical operations, another in 8.2 per cent, while my own statistics show that I have preserved the sphincter in 6 per cent of the cases operated upon. If we change the method of reporting these cases, we find that the first preserved the sphincter in but 6 per cent of the cases seen, the second in 2.6 per cent of the cases seen (in both the percentage of operability is estimated),

while I have preserved the sphincter in 3.6 per cent of the cases seen, and yet I am opposed to the operation except in the most carefully selected cases, and selected by men of experience with carcinoma of the rectum. It will be evident that preservation of the sphincter is possible in but a small proportion of the cases seen even by the enthusiast. While the patient is pleased to have the sphincter preserved, one must realize that the control of the bowel is not always satisfactory. Other reasons why the operation is not always satisfactory include the fact that frequently the bowel below is sectioned very close to the growth. In such cases if there is a recurrence it will probably be in the pelvis or at the line of union, in which case the symptoms present before operation may recur. There may be one or more fistulæ from the line of union, and a fistula discharging fæces is nearly as unpleasant as a colostomy. There is always a stricture at the line of union of the two ends which must be kept dilated at least for a long period. If there is sloughing of the distal end of the proximal loop, which is quite possible, a colostomy will be necessary and it will be exceedingly difficult to do in the sigmoid many times, because the sigmoid has been so shortened by having been pulled down into the pelvis to make the anastomosis.

These then are the operations which one must be familiar with if he believes in operating upon all patients he thinks he can make mentally and physically comfortable for one or more years. For those surgeons who see comparatively few cases a colostomy and later excision of the rectum by the posterior route should be the operation of choice.

THE ANÆSTHETIC

With the wave of enthusiasm for spinal anæsthesia, and the many surgeons who advocate its use in operations for carcinoma of the rectum, one must be bold to differ and to advocate ether anæsthesia, and yet I do not hesitate to say that I prefer ether in the combined abdomino-perineal operation in one stage. This, of course, presupposes that it is to be given by a person trained in the proper use of ether. The advantages of ether in such hands are that the surgeon is given sufficient time to finish the abdominal portion of the operation without being hurried, and that in our experience many of these patients are in better condition after ether than after spinal anæsthesia. Especially is this true in those cases of spinal anæsthesia in which a general anæsthesia must be given to finish the operation. A large proportion of the deaths from spinal anæsthesia at the Massachusetts General Hospital have occurred in cases in which a general anæsthetic had been given in addition to spinal anæsthesia. Forcing of the intestines on to the abdomen, the delay in returning them to the abdomen, and the delay caused by shifting to a general anæsthetic when the spinal anæsthesia gives out are all serious objections to its use. It must be evident, too, by this time that there are as many chest complications following spinal anæsthesia as general anæsthesia. We have had no complications due to the use of ether in over two years. Spinal anæsthesia is preferred in the second stage of the combined abdomino-perineal operation in two stages, and in the posterior operation with a colostomy, when there are no contraindications. We prefer the novocain crystals, as used by Labat.

The value of these operations can be determined by large groups of cases and need not depend any longer on the individual who reports 100 per cent of twelve—or fourteen—year cures after local resections, when, as a matter of fact, he is selecting one or two cases from the total number seen, nor need we depend upon statistics which give a low mortality and a high percentage of five-year cures without giving the total number of patients seen. We have had for many years what might be called the fourteen-year surgeon, because he repeatedly reports a case which has lived that length of time usually after a local excision and always with preservation of the sphincter! It is to be hoped that in the future cases will not be reported without the total number seen being given as well as the total number operated upon, for the careful selection of cases by an experienced man will reduce very materially the mortality and increase the percentage of five-year cures. What we want to know is the total number of cases alive, one, three, and five years after operation, out of the total number seen. We must also know how carefully the cases have been selected to appreciate the mortality rate.

The following Tables give the value of radical operations for carcinoma of the rectum

when various operations have been selected for various patients. They will give an opportunity to determine the value of operating upon 60 per cent of the total number of cases seen, as compared with a group when 32 per cent are operated upon. These Tables will give the percentage of the cases living so far as is known free from metastases three and five years after operation, after the deaths have been deducted, for what we want to know is what we could accomplish if we could get cases earlier and could reduce our mortality. These statistics seem to show that even a moderate reduction in the delay between the onset of symptoms and operation, which is now eight months, might be expected to improve our late results tremendously. Instead of an operability of 30 per cent a slight improvement in diagnosis might easily increase the operability to 60 or 70 per cent.

In defense of an operability of 60 per cent at the present time I can only point to a large number of patients who get from one to three years of mental and physical comfort. To those of you who cannot see the value of an operation that gives one or even three years of mental and physical comfort, I would advise a study of some of those who have been operated upon. Many of these cases seem to enjoy life more than the average individual, for after being down in the depths of despair with fear and discomfort they feel that they have been given a new lease of life. It is true that they have been through a dangerous, severe operation, and while I must admit a mortality of 20.7 per cent for all cases that I have

TABLE I.

ALL RADICAL OPERATIONS

Operated upon 3 years +	279	
Operated upon 5 years +	220	
Deaths	58	
Operative mortality	20.7	per cent
Total living 3 years	66	per cent
Total living 5 years	55	per cent

TABLE II.

ALL RADICAL OPERATIONS 3 YEARS +

	No. of cases	*Died in hospital per cent*	*Operated on 3 years +*	*Per Cent living 3 years*	*Operated on 5 years*	*Per cent living 5 years*
Private	147	11.5	147	73	94	70
Hospital	132	31	132	56	126	44
Total	279	20.7	279	66	220	55

TABLE III.

COMBINED ABDOMINO-PERINEAL OPERATION—ONE AND TWO STAGES

	No. of cases	*Died in hospital per cent*	*Operated on 3 years +*	*Per Cent living 3 years*	*Operated on 5 years*	*Per cent living 5 years*
Private	106	10	106	78.1	64	77.6
Hospital and private	202	20.6	202	71	157	55

COMBINED ABDOMINO-PERINEAL OPERATION—ONE STAGE

	No. of cases	*Died in hospital per cent*	*Operated on 3 years +*	*Per Cent living 3 years*	*Operated on 5 years*	*Per cent living 5 years*
Private	67	7.4	67	79	27	66

TABLE IV.

COMPARISON OF RESULTS OF OPERATING UPON 60 AND 32 PER CENT OF CASES SEEN

	No. cases seen	*Operability per cent*	*Mortality per cent*	*Per cent living 3 years*	*Per cent living 5 years*	*Total alive 3 years*	*Total alive 5 years*
Miles	100	32	7.6		72		21.3
Jones	100	60	20.7	66	55	31.4	26.2

operated upon, there is, I believe, no reason why at the present time it should be above 12 per cent. Such an operation is a serious matter to the average healthy person, but to many of these patients who are uncomfortable and depressed an operation has few terrors. The doctor and family who decide against operation for these patients rarely understand human nature or the discomforts of the patients . I have no hesitation in advising operation with removal of the growth and a colostomy in any patient who can be operated upon with a risk of 15 or even 20 per cent, if I believe that I can make him comfortable physically and mentally for one or more years.

It will be seen from the above statistics that the mortality for the whole group is high, much above that of recent groups of cases reported. A slight excuse is that the group contains all cases operated upon since the beginning of this work by myself in 1911. Another slight excuse is that all the earlier, and at least 50 per cent of the more recent cases, were operated upon in a large general hospital where it has been impossible to reduce my mortality to within 20 per cent of that of the so-called private cases. This is, I believe, due to the constantly shifting house-staff, and to the fact that the condition of the patients in a large public hospital is rather below that of patients in private hospitals. A very definite reason for a high mortality is that 60 per cent of the cases seen, instead of 25 to 35 per cent, have been operated upon. Other reasons for the immediate mortality in any group are as follows: the age of the patients, but as this will always remain the same and all groups must average the same, there is no change that can very well be made; the poor condition of the patient, usually due to obstruction, is an important factor and can undoubtedly be improved. These patients must be relieved of their partial, or occasionally complete, obstruction by a preliminary cæcostomy with a half inch tube or a colostomy in many cases, but much attention has been paid to emptying the bowel with cathartics in recent years by Rankin and Miles, who believe that proper emptying of the bowel is essential to success. Rankin's procedure is much more rigid than Miles', and will be a serious handicap to the patient if there is even a moderate amount of obstruction, or if he has been much reduced in strength. Miles gives a more definite procedure in these cases, and advises a cæcostomy immediately if the patient has severe pain following a cathartic. If there is any uncertainty as to the amount of obstruction I prefer a cæcostomy before attempting to clear the bowel. I am convinced that it is difficult, with partial obstruction, for the average surgeon to empty the colon without doing harm to many patietns. Within a short time two deaths have occurred in one of the large hospitals due to the attempt to empty the bowel before operation. Many times it will be found that the bowel has not been completely emptied even after considerable effort. Not infrequently an insufficient amount of time will be allowed and the bowel will be found to contain liquid fæces, which I consider much more dangerous than solid fæces. I much prefer a cæcostomy when an end-to-end or a lateral anastomosis is done, even if the bowel has been thoroughly emptied.

Transfusion is undoubtedly of value as an immediate post-operative measure and is carried out as a routine measure by many surgeons. We have not adopted it as a routine measure, but use it only when the condition of the patient makes it seem advisable.

The post-operative care of these patients is of the greatest importance, for it is my opinion that the mortality due to the immediate effect of the operation is very low, while the mortality from the post-operative complications continues moderately high, although greatly improved over that of fifteen years ago. Sepsis formerly played an important rôle in the immediate mortality, but in recent years this has been much less important. It is true that we have an occasional acute infection of the pelvis, and when this occurs early a retro-peritoneal infection may follow. This is, of course, often fatal. We have been unfortunate in having a temporary paralysis of the bladder in about 60 per cent of our cases, due probably to injury to the hypogastric sympathetic nerves. This requires drainage of the bladder for a period of from four days to four weeks, and of course leads to cystitis and pyelitis in a certain number of cases. Two deaths have been due to this infection. Early post-operative hæmorrhage occurs occasionally, more often in those cases in which

spinal anæsthesia has been used. Late post-operative hæmorrhage due to erosion of a vessel by sepsis is a rare cause of death. I know of only two such cases.

In recent years the most important cause of death in our practice is intestinal obstruction. This condition is exceedingly difficult to diagnose, as few of the symptoms generally associated with intestinal obstruction are present. There may or may not be nausea and vomiting; pain is generally absent, but there is a distended feeling in the abdomen of which patients complain. No gas can be obtained through the colostomy and it appears to be very dry. Distension is often moderate. Within a few hours the pulse begins to rise, and if an ileostomy is not done within twenty-four to thirty-six hours, nothing will keep the patient alive. An ileostomy done under local anæsthesia is simple and effective. A source of danger is the limb of the sigmoid which is brought through the abdominal wall. There is always a chance that small intestine will push through between the bowel and the abdominal wall. It is much safer, we believe, in spite of the time it involves, to suture the mesentery of the sigmoid to the lateral and anterior walls of the abdomen.

Great care should be taken to free the ileum if it is adherent posteriorly in the ileo-cæcal region, as the change of position due to the change in the pelvis is a frequent cause of obstruction. Probably the most important cause of obstruction is the increase in the depth of the pelvis due to removal of the rectum and pelvic fat. If a loop of bowel becomes adherent to the new pelvic floor, and this sinks deep into the hollow of the sacrum or low beneath the bladder, the depth is frequently enough to make a pull upon the mesentery of the loop so attached and this pull may be sufficient to shut off the bowel. Adhesions about the colostomy may be a cause of obstruction. Every bit of area denuded of peritoneum should be covered if possible because of this danger. In spite of the great dissection of the pelvis, death from pulmonary embolism is rare.

What is to be said for radium in these cases? To make the answer as simple as possible, I believe that every patient should be operated upon who can be with reasonable assurance that he will get one or more years of comfort, and with a mortality of not over 20 per cent. Radium may be of value in poor-risk patients with lateral wall growths sufficiently high above the sphincter to prevent burning it, and in a few far advanced cases for the purpose of stopping the bleeding. There are three great objections to its use at present, except in a few carefully selected cases. (1) The pain from the use of radium, due to a burn of the rectum or to involvement of the sphincter in the burn. This pain often extends over a period of months, and is so severe in some cases that operation is necessary to relieve it. (2) The impossibility of determining even after months as to whether the growth has been destroyed. It is frequently impossible to distinguish the thickening due to the radium burn, which may last for months, from the new growth itself. (3) In the great majority of cases it is impossible to place the radium in such a way that one can feel sure that the whole tumour will be radiated. Sir Charles Gordon-Watson has developed a technique by which radium needles are placed in the growth from a posterior incision and also from an abdominal incision, which is a great advance over the simpler method of treating the growth through the rectum, but even this, I believe, is an uncertain method, and I agree with Sir Charles when he says in the *British Journal of Surgery* for April, 1930, "Until we are in a position to measure the action of radium with some accuracy, to be able to say with confidence that a given dose of radium administered in a given way for a given time will produce a certain result, we are, I think, in duty bound to advise surgery, mutilating though it is, in preference to radium for operable cases. Where, however, as sometimes happens, the growth is operable, but the patient is considered unsuitable for radical surgery on other grounds, then I believe radium holds out great, though *uncertain,* prospects of cure and should always be employed when available." After an opportunity to see patients from many different clinics who have come for operation because of long-continued pain, and others who have come because of the inability of anyone to say whether or not the growth has been destroyed, I have little enthusiasm for radium in operable cases at the present time.